

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte DAVID JOHN ST. CLAIR  
and JAMES ROBERT ERICKSON

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Appeal No. 2003-1795  
Application 09/821,702

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ON BRIEF

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Before PAK, TIMM, and JEFFREY T. SMITH, Administrative Patent Judges.

PAK, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 15, which are all of the claims pending in the present application.

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APPEALED SUBJECT MATTER

According to the appellants (Brief, page 3):

Pending claims 1-15 stand or fall together for the argument presented by Applicants. Applicants' argument relates to the issue presented above for claims 1-15, and claim 1 is representative of the claims.

Therefore, for purposes of this appeal, we select claim 1 from all of the claims on appeal and decide the propriety of the examiner's rejection based on this claim alone consistent with 37 CFR § 1.192(c)(7)(2002). Claim 1 is provided below:

1. A crosslinkable composition comprising:

from 50 to 98 percent by weight of an epoxidized monohydroxylated polydiene polymer which is comprised of at least two polymerizable ethenically unsaturated hydrocarbon monomers wherein at least one is a diene monomer which yields substituted aliphatic double bonds that are epoxidized; and

from 50 to 2 percent by weight of an amino resin.

PRIOR ART REFERENCES

As evidence of obviousness, the examiner relies on the following prior art references:

Richards et al. (Richards)	4,518,753	May 21, 1985
Coolbaugh et al. (Coolbaugh)	5,149,895	Sep. 22, 1992
Erickson et al. (Erickson)	5,229,464	Jul. 20, 1993
Handlin, Jr. et al. (Handlin)	5,376,745	Dec. 27, 1994
Masse et al. (Masse)	5,478,885	Dec. 26, 1995

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REJECTION

Claims 1 through 15 stand rejected under 35 U.S.C. § 103 as unpatentable over Erickson, Masse and Coolbaugh in view of Handlin and Richards.

We affirm.

This is appellants' third appeal of the subject matter involving a "crosslinkable" composition. The previously appealed subject matter is identical to the subject matter of present claim 1, except for a minor semantic difference, i.e., the phrase "a diene monomer which yields substituted aliphatic double bonds that are epoxidized" is used in lieu of "a diene monomer which yields unsaturation suitable for expoxidation" in the previously appealed claim 1. Compare present claim 1 with claim 1 in our previous decisions involving Appeal Nos. 1997-2238 and 1997-4371.<sup>1</sup> The previous merits panel concluded that it would have been obvious to one of ordinary skill in the art to arrive at the previously appealed subject matter relying predominantly on

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<sup>1</sup> See also claim 1 of our decision involving Appeal No. 96-3269 which relates to a curable (cross-linkable) composition containing, *inter alia*, a monohydroxylated epoxidized polydiene polymer and a curing agent which generically includes an amino resin.

Erickson, Richards and the knowledge of one of ordinary skill in the art imputed by the appellants' admission.

Here, the appellants do not dispute that Erickson, for example, teaches "a diene monomer which yields substituted aliphatic double bonds that are epoxidized." See the Brief, page 4. Rather, the appellants repeat the arguments in the previous Briefs in Appeal Nos. 1997-2238 and 1997-4371. Specifically, the appellants argue (e.g., the Brief, pages 4 and 5) that:

The combined references do not teach, show, or suggest the claimed invention. Applicants submit that there is no motivation or suggestion in Erickson et al., Masse et al., or Coolbaugh et al. that the polymers having epoxidized aliphatic double bonds result in free chain ends or sufficient free ends to cause a problem that should be minimized. There is no indication that the functional groups of Erickson et al., Masse et al., or Coolbaugh et al. provide an insufficient amount of crosslinking or curing or an unfavorable network structure. Furthermore, Richards et al.'s description of minimizing the free ends to enhance polymer network structure also indicates that polymers that are functionalized only at their chain ends should be used predominantly (column 5, lines 16-23). Thus, Richards et al. teaches away from using the polymers described in Erickson et al., Masse et al., or Coolbaugh et al. that have functional groups at substituted aliphatic double bonds.

We are not persuaded by this argument for the factual findings and conclusions set forth in our previous decisions involving Appeal Nos. 1997-2238 and 1997-4371 and in the examiner's answer. We set forth those findings of fact and conclusions below for convenience and emphasis (e.g., the decision on Appeal No. 1997-4371, pages 4-7 and the answer page 4):

Erickson '464 discloses an epoxy resin composition which includes an epoxidized polydiene polymer which can be comprised of at least two polymerizable ethylenically unsaturated hydrocarbon monomers wherein at least one is a diene monomer (col. 1, line 54 - col. 2, line 14; col. 3, lines 11-48). There is no dispute as to whether the structural formula of Erickson '464 (col. 1, lines 54-64) encompasses or would have fairly suggested, to one of ordinary skill in the art, non-monohydroxylated I-EB-S and I-B-S species. Erickson '464 does not disclose that the epoxidized polydiene polymer can be monohydroxylated. However, Richards discloses terminating polymer chains by functional groups including hydroxyl (col. 3, line 62 - col. 4, line 14) and, regarding polymers which have a reactive group on each of its ends, i.e., telechelic polymers (col. 1, lines 33-35), teaches that terminal functionalization, i.e., functionalizing the polymer only at its ends, minimizes the number of free chain ends in the cured product and is primarily responsible for providing a favorable network structure (col. 5, lines 16-23). Although Richards specifically addresses difunctional-terminated polymers, the benefits disclosed by Richards of functionalizing polymers only at the chain ends, i.e., producing a product which has fewer free chain ends and a better polymer network structure, appear to be benefits which one of ordinary skill in the art also would have considered to be desirable for polymers which are to be terminated at only one end by a functional group. Thus, in our view, the teaching by Richards would have led one of

ordinary skill in the art to use functional groups such as hydroxyl groups as terminal groups for those polymers of Erickson `464 which are monofunctional terminated. *See In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976) (A reference encompasses not only what it expressly discloses, but also what it would have fairly suggested to one of ordinary skill in the art.).

Erickson `464 teaches that "(e)poxy groups can be converted to hydroxyl functionality, capable of crosslinking with aminoformaldehyde resins or isocyanates, by reduction or reaction with water" (col. 7, lines 49-52). As pointed out by appellants (brief, page 4), this is a disclosure of a combination of an amino resin with a polymer having hydroxyl groups rather than epoxy groups. However, . . . [the] appellants acknowledge that curing of epoxy polymers using amino resins was known in the art [(the decisions on appeal Nos. 1997-4371 and 1997-2738, pages 6 and 7, respectively)]<sup>2</sup>. [Moreover, as found by the Examiner (Answer, page 4), Masse teaches curing epoxidized polydiene with a melamine-formaldehyde as an amino resin in an amount of from about 1 to 60 percent by weight (column 8, lines 19-29)].

The polymer suggested by the combined teachings of Erickson '464 and Richards has both epoxy groups and a terminal hydroxyl group. **Because it was known in the art that amino** resins are effective for crosslinking polymers having hydroxyl groups as taught by Erickson `464 and having epoxy groups as taught by ... [Masse] and acknowledged by appellants, these references would have fairly suggested, to one of ordinary skill in the art, using amino resins to crosslink polymers having both epoxy groups and hydroxyl groups, and would have had a reasonable expectation of success in doing so. Thus, use of amino resins to crosslink epoxidized

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<sup>2</sup> It is axiomatic that our consideration of the prior art must, of necessity, include consideration of the admitted prior art. *See In re Hedges*, 783 F.2d 1038, 1039-40, 228 USPQ 685, 686 (Fed. Cir. 1986); *In re Davis*, 305 F.2d 501, 503, 134 USPQ 256, 258 (CCPA 1962) .

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monohydroxylated polydiene polymers would have been *prima facie* obvious to one of ordinary skill in the art. *See In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988).

Appellants argue . . . that there is no motivation to combine the references (brief, pages 4-5). This argument is not persuasive because Richards' teaching that terminal functionalization minimizes the number of free chain ends in the product and is the primary contributor to a favorable polymer network structure (col. 5, lines 20-23) would have led one of ordinary skill in the art to functionalize the ends of the Erickson '464 polymers, including those which have only one end to be functionalized, so that the polymers have fewer chain ends in the product and have a better polymer network structure. The reason for using an amino resin to crosslink the epoxidized monohydroxylated polydiene polymer is set forth above.

For the above reasons, we conclude that the applied prior art references would have rendered the presently claimed subject matter obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103. Accordingly, we affirm the examiner's decision rejecting claims 1 through 15 under 35 U.S.C. § 103.

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No time period for taking any subsequent action in  
connection with this appeal may be extended under 37 CFR  
§ 1.136(a).

AFFIRMED

CHUNG K. PAK	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
CATHERINE TIMM	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
	)	
	)	
JEFFREY T. SMITH	)	
Administrative Patent Judge	)	

CKP:dal



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